

REMARKS

The statement by the Examiner that claims 4, 5, 7, 12, 13 and 15 contain allowable subject matter is gratefully acknowledged by the Applicant.

Claims 1, 3, 4, 5, 7, 9, 11, 12, 13, 15, 17, 32 and 33 have been amended. Claims 2, 10 and withdrawn claims 20-31 have been canceled. Claims 1, 3-9, 11-19 and 32-34 are pending in this application. Applicant reserves the right to pursue the original claims and other claims in this application and in other applications.

After an initial Restriction Requirement, the Examiner required a further restriction between claims 1-19 and 32-34 (i.e., group I) and claim 20 (i.e., group II). During a telephonic interview with the Examiner, Applicant's representative provisionally elected to prosecute the claims of group I (i.e., claims 1-19 and 32-34) at this time. The election was made without traverse. Applicant is affirming this election as requested by the Examiner.

Applicant's representative thanks the Examiner for confirming, in a telephone conversation on June 10, 2004, that Applicant was not required to provide a separate paper containing a statement regarding the substance of the May 5, 2004 telephonic interview.

Claims 1-3, 6, 8-11, 14, 16 and 32 stand rejected under 35 U.S.C. § 102(a) as being anticipated by Lindholm et al., U.S. Patent no. 6,198,488 (hereinafter "Lindholm"). The rejection is respectfully traversed.

Claim 1 recites a datapath for processing input data. The datapath comprises "at least one arithmetic pipeline" that "is subdivided into a plurality of subsections, each subsection corresponding to a subset of the input data." According to claim 1, the "at least one of said subsections comprises a flat four-input floating point adder

module.” Applicant respectfully submits that Lindholm fails to disclose the claimed invention.

Specifically, Applicant respectfully submits that Lindholm fails to disclose a pipeline or a pipeline subsection that includes a “flat four-input floating point adder module.” The Office Action states that Lindholm’s Figure 7 discloses a four-input adder. Applicant respectfully submits, however, that the “adder” used in the Lindholm device is a hierarchal two-input adder tree, not a “flat four-input adder” as required by claim 1. That is, the claimed flat four-input floating point adder module 230 is “flat” such that all four floating point inputs are handled and added at the same time (i.e., $a+b+c+d$). Lindholm, on the other hand, uses three two-input adders (see Figure 7) configured in a hierarchical tree. That is, Lindholm uses one adder to determine $(a+b)$, a second adder to determine $(c+d)$, and a third adder to determine $(a+b)+(c+d)$. This is something completely different than the claimed “flat” four-input floating point adder module, which as set forth in Applicant’s specification, provides improved data throughput and significantly reduced gate count in comparison to a hierarchal two-input adder tree (such as the one used in Lindholm). See Present Specification ¶ [0070].

Accordingly, Applicant respectfully submits that claim 1 is allowable over Lindholm. Claims 3, 6 and 8 depend from claim 1 and are allowable along with claim 1 for at least the reasons set forth above and on their own merits.

Claims 9, 11, 14, and 16 each recite “at least one arithmetic pipeline is subdivided into a plurality of subsections, each subsection corresponding to a subset of the input data, and wherein at least one of said subsections comprises a flat four-input floating point adder module.” As such, claims 9, 11, 14, and 16 are allowable over Lindholm for at least the reasons set forth above and on their own merits.

Claim 32 recites “a data processing pipeline coupled to said processor, said data processing pipeline comprising at least one datapath, each datapath inputting data and being controllable to perform at least one mathematical operation on the data as the data passes through the datapath, wherein each datapath is capable of performing a four component dot product as the data passes through said datapath a single time, and wherein a portion of the datapath comprises a flat four-input adder module.” As such, claim 32 is allowable over Lindholm for at least the reasons set forth above and on its own merits. Claims 2 and 10 have been canceled. Accordingly, the rejection should be withdrawn and claims 1, 3, 6, 8-9, 11, 14, 16 and 32 allowed.

Claims 17-19, 33 and 34 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lindholm. The rejection is respectfully traversed.

Claim 17 recites “a vertex engine coupled to a first stage of said graphics pipeline, said vertex engine comprising a plurality of datapaths, each datapath inputting vertex data and being controllable to perform at least one mathematical operation on the vertex data as the data passes through the datapath, wherein each datapath is capable of performing a three component dot product as the vertex data passes through said datapath a single time, and wherein a portion of the datapath comprises a flat four-input adder module.” Applicant respectfully submits that for at least the reasons set forth above, claim 17 is allowable over Lindholm. Claims 18 and 19 depend from claim 17 and are allowable along with claim 17.

Claim 33 recites “a graphics point pipeline coupled to said processor, said graphics pipeline comprising a vertex engine coupled to a first stage of said pipeline, said vertex engine comprising a plurality of datapaths, each datapath inputting vertex data and being controllable to perform at least one mathematical operation on the vertex data as the data passes through the datapath, wherein each datapath is capable

of performing a three component dot product as the vertex data passes through said datapath a single time, and wherein a portion of the datapath comprises a flat four-input adder module." Applicant respectfully submits that for at least the reasons set forth above, claim 33 is allowable over Lindholm. Claim 34 depends from claim 33 and is allowable along with claim 33. Accordingly, the rejection should be withdrawn and claims 17-19, 33 and 34 allowed.

Claims 4, 5, 7, 12, 13 and 15 stand objected to as being dependent upon rejected base claims, but are otherwise allowable if rewritten as independent claims including the limitations of their respective base and any intervening claims. Claims 4, 5, 7, 12, 13 and 15 have been rewritten as independent claims including the limitations of their respective base and any intervening claims. Accordingly, claims 4, 5, 7, 12, 13 and 15 are allowable for at least the reasons set forth in the Office Action. The objection should be withdrawn and the claims allowed.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

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Respectfully submitted,

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